

REMARKS/ARGUMENTS

This Amendment is in response to the Office Action mailed on January 12, 2006 (“Office Action”). Claims 15-27 and 36-52 were rejected in view of U.S. Patent 5,909,355 (“Parkhe”) either alone or in combination with other references cited by the Examiner. Applicant respectfully traverses this rejection.

Independent claim 15 is directed at a resistive heater for heating a semiconductor processing chamber including a doped ceramic heating element and an undoped ceramic material encasing at least a portion of the heating element to form a monolithic plate. Independent claim 36 is directed at an undoped ceramic material covering a doped ceramic heating element to form a heating surface shaped to receive a semiconductor wafer. Independent claim 44 is directed at a doped ceramic heating element forming a trace having a plurality of adjacent segments, and an undoped ceramic material between the adjacent segments and forming a continuous surface for heating a semiconductor wafer. Independent claim 47 is directed at a susceptor comprising an undoped ceramic material shaped to receive a semiconductor substrate, and a doped ceramic heating element at least partially embedded within the susceptor. Independent claim 48 is directed at an undoped ceramic material between a first doped ceramic heating element and a second doped ceramic heating element that forms a continuous surface for heating a semiconductor wafer.

In rejecting independent claims 15, 36, 44, 47 and 48, the Examiner refers to layer 212 of Parkhe as being a doped ceramic heating element and cites column 3, lines 25-63. Layer 212 in Parkhe is not a doped ceramic heating element as argued by the Examiner. Rather, layer 212 refers to a second layer of dopant material which is capable of altering the resistivity of an electrostatic chuck for purposes of providing desirable chucking and dechucking conditions. See col. 3, lines 27-29. As stated at column 4, lines 24-31:

This decrease in resistivity provides a highly desirable chucking and dechucking conditions. Specifically, the Johnsen-Rahbek effect establishes a reliable chucking force that is greater than that provided by a Coulombic chuck. Since doping of the first layer 202 is highly controlled there is no excessive charges in the chuck which need to be eliminated to effectively dechuck the wafer from the top surface 220. Additionally, lower processing

temperatures place less thermal stress on chamber components as well as a wafer being processed.

The Johnsen-Rahbek effect is described in the background section of Parkhe: “The Johnsen-Rahbek effect establishes a small, but highly effective current flow between the substrate support surface and the substrate being retained. As such, a chucking force that is much greater than the force generated by a purely Coulombic effect electrostatic chuck retains the substrate to the support surface.” Col. 1, lines 35-41.

The chucking voltage is not applied to layer 212 to create a resistive heating element. In fact, the electrostatic chuck with layer 212 is described as being capable of “retaining a semiconductor wafer to be processed, via the Johnsen-Rahbek effect, *at room temperature*.” Col. 4, lines 55-58. See also col. 2, lines 25-28 (“Specifically, the resistivity of the chuck is reduced to a value that facilitates establishment of the Johnsen-Rahbek effect and promotes wafer processing *at room temperature*.”) (emphasis added).

Parkhe does disclose separate heater electrodes, which can be “a single heater, two or more heaters for zoned heating and the like”. Col. 3, lines 19-22. However, these heater electrodes are shown as element 208 in Figures 2 and 3 of Parkhe and are not part of layer 212. Moreover, these heater electrodes are described as being molybdenum or tungsten (col. 3, line 22), and not doped ceramic heating elements.

Accordingly, Parkhe does not teach or disclose a doped ceramic heating element and undoped ceramic material in the claimed combinations set forth in independent claims 15, 36, 44, 47 and 48. In view of this deficiency, it is believed that Parkhe does not anticipate or render obvious independent claims 15, 36, 44, 47 and 48, either alone or in combination with the other references cited by the Examiner. Claims 15-35, 37-43, 45-46 and 48-52 depend from these independent claims and, therefore, are also believed to be patentable.

Appl. No. 09/998,801
Reply to Office action of Jan. 12, 2006

CONCLUSION

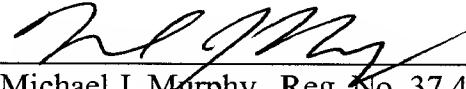
Applicants submit that the instant application is in condition for allowance. Should the Examiner have any questions, the Examiner is requested to contact the undersigned attorney.

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. 23-2415 (Docket No. 14912.832).

Respectfully submitted,

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Date: May 26, 2006



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